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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/824,728	04/04/2001	Tomohito Kunda	15-7	1763

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EXAMINER

SAINT SURIN, JACQUES M

ART UNIT	PAPER NUMBER
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2856

DATE MAILED: 12/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/824,728

Applicant(s)

KUNDA, TOMOHITO

Examiner

Jacques M Saint-Surin

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AW

-- Th MAILING DATE of this communication appears on th cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,9-16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6,9-16 and 18 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment of 05/27/03.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1-6, 9-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahara (US Patent 6,323,529) in view of Tsukagoshi et al. (US Patent 5,843,251).

Regarding claims 1, 9 and 12, Nagahara ('529) discloses a semiconductor dynamic sensor (semiconductor acceleration sensor 10, see: Figs. 1 and 2 and col. 3, line 51) comprising: a semiconductor sensor chip having a member movable according to a dynamic force applied thereto (sensor chip 3 for detecting displacement of a mass, see: col. 3, lines 52-53), the semiconductor sensor chip outputting a sensor signal in response to an amount of movement of the movable member (signal processing chip 5 for calculating acceleration or impact based on the detected displacement, see: col. 3, lines 53-54); and a substrate (die pad 11) for mounting and supporting the semiconductor sensor chip (3) thereon. However, Nagahara does not specifically disclose or suggest wherein the semiconductor sensor chip (3) is connected to the substrate via an adhesive film (5). Tsukagoshi ('728) discloses an adhesive layer 5 can be formed by spreading an adhesive in the form of a film and attaching it to the wafer surface by using a roll or other means, see: col. 7, lines 54-57. It would have been

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obvious to one having ordinary skill in the art at the time of the invention to employ in Nagahara the adhesive layer of Tsukagoshi because it would provide a process for connecting circuits with markedly improved connection reliability and workability and an adhesive film used therefor.

Regarding claims 2, 10 and 13, Nagahara discloses the substrate 5 is a semiconductor chip having a circuit for processing the sensor signal (col. 3, lines 45-53) and the acceleration chip 3 is connected to the first surface of the semiconductor chip 5, and a second surface of the semiconductor chip 5 is connected to the package case 2.

Regarding claims 3, 11 and 14, Tsukagoshi et al. ('251) discloses also the electrodes may be formed with a pressure-deformable material such as a thermoplastic material and their surfaces coated with a metal (see: col. 5, lines 32-34).

Regarding claims 4 and 15, Tsukagoshi et al. ('251) discloses the adhesive layer has a thickness of 50 μm or less, see: col. 8, lines 15-17. It would have been

Regarding claims 5 and 16, Nagahara does not specifically disclose or suggest an elasticity coefficient of the adhesive film is less than 3,000 mega pascal. Note that Tsukagoshi et al. ('251) discloses as for the other properties of the adhesive after curing used in the present reference it is desirable that the concentration of each impurity ion (Na^+ , K^+ , SO_4^{--} , etc.) is less than 20 ppm, the modulus of elasticity is below 10,000 kgf/cm^2 and the coefficient of thermal expansion is less than $2 \times 10^{-4} / ^\circ\text{C}$. The optimization of proportions in a prior art device is a design consideration within the skill of the art. In re Reese, 290 F.2d 839, 129

USPQ 402 (CCPA 1961). Therefore, one of the ordinary skill in the art using the techniques of Nagahara and Tsukagoshi would be motivated to recognize how to provide an adhesive film with an elasticity coefficient of less than 3,000 mega pascal and would operate effectively in a similar manner as claimed.

Regarding claims 6 and 18, Nagahara discloses a semiconductor sensor chip for sensing acceleration (acceleration sensor chip 3 for detecting displacement of a mass, see: col. 3, line 51).

Allowable Subject Matter

4. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Kata et al. (US Patent 5,897,337) discloses a process for adhesively bonding a semiconductor chip to a carrier film.

Response to Arguments

5. Applicant's arguments with respect to claims 1-6 and 9-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tsukagoshi et al. (US Patent 6,113,728) discloses a process for connecting circuits and adhesive film used therefore.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M Saint-Surin whose telephone number is (703) 308-3698. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.


Jacques M. Saint-Surin
November 19, 2003


HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800